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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 30 AUG 2004

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Applicant's or agent's file reference P045170	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/JP 03/09821	International filing date (day/month/year) 01.08.2003	Priority date (day/month/year) 02.08.2002
International Patent Classification (IPC) or both national classification and IPC G06F17/50		
Applicant YAZAKI CORPORATION et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 8 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 27.02.2004	Date of completion of this report 27.08.2004
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/JP 03/09821**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-35 as originally filed

Claims, Numbers

1-8 as originally filed

Drawings, Sheets

1-8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 1-3

because:

☒ the said international application, or the said claims Nos. 1-3 relate to the following subject matter which does not require an international preliminary examination (specify):

see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4-8
	No: Claims	
Inventive step (IS)	Yes: Claims	6
	No: Claims	4,5,7,8
Industrial applicability (IA)	Yes: Claims	4-8
	No: Claims	

2. Citations and explanations

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see separate sheet

Re Item I

Basis of the report

- D1: SUGIHARA K: "Estimation of the Sizes of Wire Bundles in Manufacturing" MATHEMATICAL METHODS IN MANUFACTURING AND LOGISTICS, [Online] vol. 54, no. 2001, 16 December 2001 (2001-12-16), page 14, XP002285233 MATHEMATISCHES FORSCHUNGSINSTITUT OBERWOLFACH Retrieved from the Internet: URL:www.mfo.de/programme/schedule/2001/51/ Report_54_01.ps> [retrieved on 2004-06-18]
- D2: HUANG ET AL: "Local Search Based on a Physical Model for Solving a Circle Packing Problem" MIC'2001 4TH METAHEURISTICS CONFERENCE, 16 July 2001 (2001-07-16), - 20 July 2001 (2001-07-20) pages 455-459, XP002285969 PORTO, PORTUGAL
- D3: ARAI M ET AL: "Packing circles under variable spatial constraints: a vibration control approach" 1998, AMSTERDAM, NETHERLANDS, IOS PRESS, NETHERLANDS, 1998, pages 727-734, XP002285970 ISBN: 90-5199-398-6

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. Claims 1 to 3:

The subject-matter of claims 1 to 3 does not comply with Article 34(4)(a)(i) and Rule 67(ii) PCT. These method claims relate to purely abstract (design) activities, neither specifying the use of any physical means to perform the steps of the methods, nor producing any concrete tangible result or any effect on a concrete physical entity. Lacking a manifest effect in the real world, such claims are considered to be mental acts as such, lacking technical character, and are thus considered not to fulfil the requirements of Article 34(4)(a)(i) and Rule 67(ii) PCT.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2. Claims 4 and 8:

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The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 4, 5, 7 and 8 does not involve an inventive step in the sense of Article 33(3) PCT.

The document **D1** is regarded as being the closest prior art to the subject-matter of claim 4, and shows (the references applying to this document):

- a) An apparatus for calculating an outside diameter of a wire packing which is formed by bundling and packing a plurality of wires into the smallest possible circular shape so as not to overlap each other: page 14, estimate the sizes of bundles of wires; we simulate the wire holding process; the apparatus is a general computer executing the simulation.
- b) including-circle assuming means for assuming an including circle which includes a plurality of circles arranged in a plane so as not to overlap each other by assuming that cross-sectional shapes of the plurality of wires are the plurality of circles having diameters corresponding to respective outer shapes thereof: page 14, given a set of discs of various sizes, find a placement of these discs in a plane without overlap so that the enclosing circle is sufficiently small.
- c) target-circle defining means for determining a target circle which has the same center as that of the including circle and is slightly smaller than the including circle, and from which at least one of the plurality of circles protrudes: page 14, starting with an arbitrary placement of discs and their enclosing circle, we choose a slightly smaller "target" circle and try to push all the protruding circles into the interior of the circle.
- d) inserting means for inserting the insertion trial circle in a space in the target circle: page 14, try to push all the protruding circles into the interior of the circle.
- e) first search controlling means in which in a case where all the insertion trial circles have been inserted in the target circle, a new target circle which is slightly smaller than a present one and has the insertion trial circle is set, and the search by the searching means is then effected: page 14, if we succeed we make the target circle still smaller.
- f) input means for inputting initial information concerning the plurality of wires: general computers have input means.

g) output means for outputting at least the outside diameter of the including circle: general computers have output means.

The subject-matter of claim 4 differs from this known D1 in the features of:

- searching means in which the circle protruding from the target circle is set as an insertion trial circle, and positions are searched to which the plurality of circles other than the insertion trial circle can be moved as distantly as possible within the target circle without overlapping each other.

The problem to be solved by the present invention may be regarded as:

- given a set of circles, from which at least one circle protrudes from an enclosing target circle, how to change the layout of the set of circles so that all circles fit into the target circle.

The solution proposed in claim 4 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

- D1 discloses that "we... try to push all the protruding circles into the interior of the target circle. ...we simulate the wire holding process". A person skilled in the art would know that when the protruding circles are pushed into the interior of the target circle, the rest of circles within the wire will be pushed **away** from the protruding circles. Consequently, it is considered to be obvious for a person skilled in the art to try to position the rest of the circles as distantly as possible from the protruding circles.

- 2.1 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 8, which therefore is also considered not inventive.
3. Dependent claims 5 and 7 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step. The reasons therefore are:
 - 3.1 Claim 5: it is part of the customary practice of the person skilled in the art to compute the results of computations. In the case of claim 5 the positions of the including circle and the plurality of circles are result of the computations.
 - 3.2 Claim 7: D1 discloses on page 14 that: ...otherwise we choose a circle between the current enclosing circle and the old target circle as a new target circle.

4. Claim 6:

The combination of the features of dependent claim 6 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

a) When compared to the method of D1, claim 6 provides a concrete way of how to calculate the positions of the plurality of circles, so that they are placed as distantly as possible from the insertion trial circle. As a consequence, claim 6 solves the problem of further reducing the diameter of the enclosing circle.

b) When confronted with this problem, the skilled person would search for documents describing solutions to the packing of unequal circles within a larger circle, thereby finding documents D2 and D3. The methods disclosed in D2 and D3 are different to the method of claim 6. Moreover, it is not obvious to arrive at the subject-matter of claim 6 by considering D2 or D3. The solutions provided by the methods of D2 or D3 are, in general, different from the solutions provided by the method of claim 6 (different estimated diameter and circle positions), whereby **different technical effects** are provided. As a consequence, none of the methods of D2 or D3 can be considered to be mathematically equivalent to the method of claim 6.